

## (54) LIQUID CRYSTAL DISPLAY DEVICE

(11) 2-214826 (A) (43) 27.8.1990 (19) JP

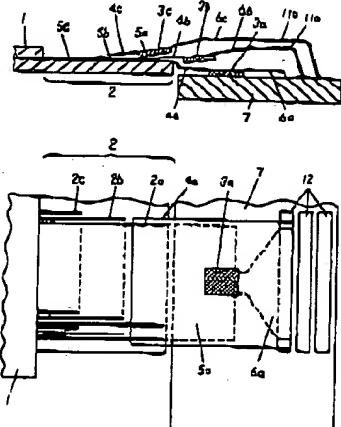
(21) Appl. No. 64-36756 (22) 16.2.1989

(71) MATSUSHITA ELECTRIC IND CO LTD (72) HIROSHI TAKAHASHI

(51) Int. Cl<sup>o</sup>. G02F1/1345, G09F9/30

**PURPOSE:** To improve the reliability of connection between the feed terminal part of a liquid crystal display element and the output terminals of a driving element by connecting the output terminals of independent driving elements to the feed terminals which are separated in color.

**CONSTITUTION:** The output terminals 5a-5c of film carriers 4a-4c where the driving elements 3a-3c are mounted are connected to the feed terminals 2a-2c of the liquid crystal display element 1 with an UV setting type adhesive, etc., in this case, the feed terminals 2a-2c are separated in a three-stage shape while lead-out wiring is varied, line by line, and the output terminals 5a-5c of the film carriers 4a-4c are connected to the respective stages. Thus, the output terminals of the independent driving elements are connected to the feed terminals which are separated in color so the pitch of the output terminals of the driving terminals does not decrease. Consequently, the reliability of connections between the feed terminal part of the liquid crystal part and the output terminals of the driving elements is improved.



## (54) STRUCTURE AND PRODUCTION OF REFLECTION TYPE ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE

(11) 2-214827 (A) (43) 27.8.1990 (19) JP

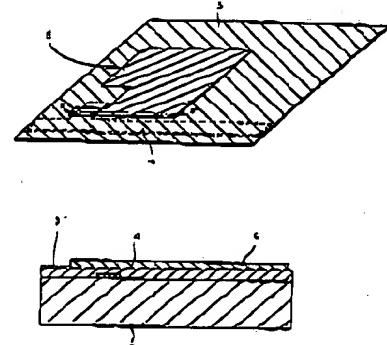
(21) Appl. No. 64-36992 (22) 16.2.1989

(71) SEIKO INSTR INC (72) TSUNEO YAMAZAKI

(51) Int. Cl<sup>o</sup>. G02F1/136, G02F1/13

**PURPOSE:** To obtain the display device which hinders the display of shadows and has an excellent resolution and contrast ratio by using an opaque metallic electrode as a liquid crystal driving electrode of an active matrix substrate and providing a reflecting plate in a liquid crystal cell.

**CONSTITUTION:** A nonlinear type resistance film 5 consisting of silicon, nitrogen, carbon, etc., is formed over the entire surface on a signal input electrode 4 formed of a metal, such as chromium or aluminum, and further the liquid crystal driving electrode 6 is so provided thereon as to be partly overlapped on a signal input electrode 4 to form the nonlinear type element. The material of the liquid crystal driving electrode 6 consists of metals, such as aluminum, molybdenum and chromium. Since the opaque metallic material is used as the liquid crystal driving electrode in such a manner, the parallax by the thickness of the glass between the reflecting plate and the liquid crystal cell is lowered to substantially zero. The reflection type active matrix liquid crystal display device which has the resolution to prevent viewing of the reflected images and has the excellent contrast ratio is obtd. in this way.



7: insulating substrate

## (54) INTEGRATED OPTICAL WAVEGUIDE DEVICE

(11) 2-214828 (A) (43) 27.8.1990 (19) JP

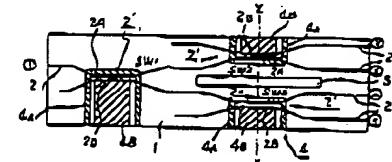
(21) Appl. No. 64-36961 (22) 16.2.1989

(71) FUJITSU LTD (72) NAOYUKI MEKATA(1)

(51) Int. Cl<sup>o</sup>. G02F1/313, G02F1/03

**PURPOSE:** To remove electric crosstalk between adjacent optical control electrodes even when the optical control electrodes are integrated on the same substrate adjacently by providing an elastic wave propagation inhibiting means.

**CONSTITUTION:** The elastic wave propagation inhibiting means 5 is provided on the substrate 1 between adjacent optical switches e.g. SW2 and SW3 of a directional coupler type optical switch. The elastic wave propagation inhibiting means 5 is improved in effect more by forming grooves, applying an elastic wave absorber, e.g. silicone resin which contains, for example, mixed heavy metal powder by coating or screen printing, or burying the elastic wave absorber in the grooves. Consequently, the electric crosstalk which is generated through an elastic wave propagated mainly nearby the substrate surface can be removed.



2: optical waveguide, 2': optical control waveguide part,  
2A: parallel optical waveguide, 2B: parallel optical waveguide,  
4: optical control electrode, 4B: earthed electrode, 5:  
electrode for control